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PHOOTOGRAPHIC
INTERPRETATION
REPORT

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**IMAGERY ANALYSIS OF SS-X-16/-20
ACTIVITY AT THREE DEPLOYED SSM
COMPLEXES AND TWO SOVIET MISSILE
TEST CENTERS, NOVEMBER 1974--
OCTOBER 1976**

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MARCH 1977

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IMAGERY ANALYSIS OF SS-X-16/-20 ACTIVITY AT THREE DEPLOYED SSM COMPLEXES AND TWO SOVIET MISSILE TEST CENTERS, NOVEMBER 1974—OCTOBER 1976

INTRODUCTION

1. Since November 1974, significant SS-X-16/-20-related activity has been seen at three Soviet deployed SSM complexes and two offensive missile test centers. This activity included the construction of three distinct types of drive-in garages, modifications to existing missile-related buildings, modifications and new construction at the rail-to-road transfer points (RRTPs) serving the deployed SSM sites, and the deployment of TWIN EAR troposcatter communications vehicles in support of the two missile systems. This report, which is a photographic analysis of this activity, was prepared to assist the intelligence community in the overall analysis of the development and deployment of the SS-X-16 ICBM and SS-X-20 IRBM strategic missile systems. Since the construction activity at these facilities is incomplete, this analysis represents preliminary views subject to further interpretation as more information becomes available. The information in this report is current through 25 October 1976.**

2. This report includes annotated photographs, three tables, and a perspective drawing. The following table gives the full TDI name and BE number for the facilities discussed in this report.

Plesetsk Missile/Space Test Center SSM
 Kapustin Yar Msl/Space Test Center SSM
 Konkovich SSM Complex
 Kozhanovich SSM Complex
 Drovyanaya SSM Complex
 Volgograd Steel A Mach P Krasnyy Barrikada 221

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BACKGROUND

3. Testing of the SS-X-16 ICBM at the Plesetsk Missile/Space Test Center (PMSTC) and the SS-X-20 IRBM at the Kapustin Yar Missile/Space Test Center (KYMSTC) has been underway since March 1972 and September 1974, respectively. It is believed that these two missile systems are being developed for a mobile function. Photography of the two test centers and of production facilities associated with the SS-X-16/-20 systems indicates that the ground support equipment (GSE) for these two systems with the exception of the missile canister is the same.¹ The equipment includes a probable transporter-erector-launcher (TEL), a probable resupply vehicle, a MAZ-543 missile support van (MSV) that has been identified in several configurations, and a [redacted] van truck. The TEL, the resupply vehicle, and the van truck are unique to the SS-X-16/-20 systems. The MAZ-543 MSV has been seen in a support function for the SS-14 MRBM and the currently deployed SS-18 ICBM. A shorter [redacted] version of the [redacted] van truck has been seen at Kapustin Yar and at a major SS-X-16/-20 GSE production facility, Volgograd Plant 221. In addition, TWIN EAR troposcatter communications antennas have been seen in a mobile configuration mounted atop trailers and van trucks in SS-X-16/-20-related areas at Plesetsk and Kapustin Yar.

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IMAGERY ANALYSIS

New Building Construction and Modifications at Three Deployed SSM Complexes

4. Since late 1975, extensive new building construction and modification activity probably related to the deployment of a mobile missile system has been underway at three Strategic Rocket Forces (SRF) launch complexes. This activity included construction of 68 buildings, which are still in various stages of construction, and modifications of existing missile-ready buildings/bunkers. Two of the installations where this activity is taking place, Konkovich MRBM Launch Site 1 (Figure 1) and Kozhanovich MRBM Launch Site 2 (Figure 2), are deactivated SS-4 soft sites in the Konkovich and Kozhanovich SSM Complexes in the western section of the Soviet Union. The other installation, Drovyanaya ICBM Launch Site 4 (Figure 3), is a deactivated SS-7 soft site in the Drovyanaya ICBM Complex in the far eastern section of the Soviet Union. Construction activity was first observed in November 1975 at Konkovich and in July 1976 at Kozhanovich and Drovyanaya.

5. Of the 68 buildings being constructed at the SRF sites, the most significant are divided into three distinct types of drive-in garages—11-bay (Figure 4, A and B), three-bay (Figure 5, A and B), and single-bay (Figure 6, A, B, and C).

**Since October 1976, new SS-X-20 IRBM-related activity has been observed at Drovyanaya ICBM Complex Launch Site 3 and Novosibirsk ICBM Complex Launch Site 2, indicating that two additional SS-X-20 support bases are probably under construction.

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6. Analysis of the placement of these three garage types and the additional support buildings (Figures 1, 2, and 3) at Konkovich, Kozhanovich, and Drovyanaya shows that these buildings are constructed in no apparent pattern or orientation. The only consistency in construction observed is that the three-bay and single-bay garages are within the launch site security fences near the old launch pads. The 11-bay garage is being constructed at the launch sites and in nearby site support facilities. Table 1 presents a summary of construction activity concerning these three garage types.

Function of Drive-in Garages

7. On the basis of the number of 11-bay buildings under construction (Table 1 and Figure 4B) and the usable depth of the bay, [] these buildings will probably house the [] van truck. More of these van trucks have been seen at KYMSTC than any other SS-X-20/-16 support vehicle. Also, one of the early sightings in June 1975 of ground support vehicles at the General Support Facility at Kapustin Yar showed that eleven [] van trucks were probably part of the initial shipment of GSE for the SS-X-20 test/training program. This evidence suggests that the SS-X-20 and possibly the SS-X-16 systems require the support of a considerable number of [] van trucks; therefore, more garages would be required. This evidence is supported by the number of 11-bay garages seen at Konkovich, Kozhanovich, and Drovyanaya.

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8. Photography [] at the KYMSTC Launch Complex C Site 2C2 (Figure 7) showed that the three-bay garage will probably house three MAZ-543 MSVs. On that date, three MAZ-543 MSVs were seen inside a wood-frame, three-bay shelter probably built to support an SS-X-20 crew training exercise at the site. Also, it is possible that one MAZ-543 MSV may support a single SS-X-20/-16 TEL since cable trenching has been seen interconnecting a three-bay garage with three single-bay garages at Kozhanovich Launch Site 2. At Drovyanaya Launch Site 4 trenching has been seen extending from a three-bay garage to at least two single-bay garages (Figure 3).

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9. Single-bay garages under construction at the three deployed SSM complexes are of a completely unique design (Figure 6, A, B, and C). The uniqueness is due partially to the sliding-roof capability. Three single-bay garages at Drovyanaya and two at Kozhanovich have sliding-roof sections. It is believed that some, and perhaps all, of the other single-bay garages at the three SSM complexes may have this capability. On the basis of the sliding-roof capability and the dimensions of the single-bay garages [], this type of garage may be used to house a TEL with canister. These garages may function as missile-ready buildings while the TELs are in garrison and could serve as emergency launch points. These single-bay garages are large enough to house either the SS-X-16 or the SS-X-20 TEL with missile canister.

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10. In the future, construction of these three types of garages will be an early indication of possible deployment of a mobile missile system. More importantly, as these buildings are completed and their function is known, they should help in determining the number of missiles and GSE required to support a mobile missile system.

11. In addition to the construction of new buildings, modifications to existing missile-ready buildings/bunkers have also taken place at the three deployed SSM sites since November 1975. Although the purpose is not known, the timeframe in which these modifications occurred suggests that this activity is related to the other construction activity seen at the deployed sites. A summary of these modifications is presented in Table 2.

Construction Activity at the Rail-to-Road Transfer Points

12. Construction and upgrading activity at the RRTPs serving the Konkovich, Kozhanovich, and the Drovyanaya sites is underway. Upgrading was first observed at the Konkovich RRTP in November 1975. Since that time, the existing loop-road network at the RRTP and the road interconnecting this area to Konkovich MRBM Launch Site 1 have been widened and improved with concrete paving blocks. Also, seven new buildings and miscellaneous sheds have been constructed at or near the RRTP (Figure 8). How these support-type buildings are related to the SS-X-20 construction program and what function they serve are unknown. The rail spur serving this RRTP has not been altered. However, [] a framework with a canvas covering was erected over a 22-meter section of the rail spur and by [] the canvas had been removed (Figure 8).

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13. At Kozhanovich RRTP, initial modifications were seen on photography [] [] A probable new rail siding and paving of the existing road network interconnecting the RRTP to Kozhanovich MRBM Launch Site 2 were underway.

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14. Similar modifications and construction are also in progress at Drovyanaya RRTP. Initial grading was discernible at the RRTP as early [] however, little change was observed through [] preparations for a new offloading facility were underway.

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Table 1. Summary of Data on SS-X-16/-20-Related Buildings

Building Type	Location	Number of Buildings	Construction Status	Roof Vents	Remarks
	Konkovich Launch Site 1	3	2 complete 1 ucon	2 yes 1 undet	Foundations only observed for the garage ucon
	Kozhanovich Launch Site 2	2	1 complete 1 ucon	Yes	Foundations only observed for the garage ucon
11-bay garage	Drovyanaya Launch Site 4	2	1 complete 1 ucon	Yes	Garage ucon; in mid-to-late stage of construction
	Kapustin Yar Msl/Rec/Insp/Stor Area	1	Ucon	Undet due to construction status	Mid-stage of construction
	Plesetsk ICBM Launch Test Site 4	1	Ucon	Undet due to construction status	Foundations only as of ; measurement of foundations indicates that, when complete, these garages may be approx 6 meters deeper than the 11-bay garages at the three deployed SSM sites
	Plesetsk ICBM Launch Test Site 7	2	All 3 ucon 1 poss	Undet due to construction status	
	Konkovich Launch Site 1	3	Complete	Yes	Trenches extend from the 3-bay garages but a connection with the single-bay garages has not been established
	Kozhanovich Launch Site 2	3	Complete	Yes	Cable trench interconnects regimental HF bunker with the 3-bay garages; cable trenches interconnect a 3-bay garage with 3 single-bay garages
3-bay garage	Drovyanaya Launch Site 4	3	All 3 almost complete	Yes	Cable trenches extend from each 3-bay bldg to at least 2 single-bay garages
	Plesetsk ICBM Launch Test Site 5	1	Complete	Yes	extension added to the front of this partially bunkered garage that once housed SS-7 support vehicles; this is the only 3-bay garage-type building at a launch site undergoing modification at Plesetsk MSTC
	Konkovich Launch Site 1	7	Complete	No	Unable to determine how these 7 garages inter connect by cable trenching to other garages at the launch site; none of the single-bay garages has a confirmed sliding-roof capability
	Kozhanovich Launch Site 2	10	4 complete 6 ucon	No	Only 2 have confirmed sliding roofs
	Drovyanaya Launch Site 4	6 3 poss	Complete Ucon	No	3 of the 6 completed single-bay garages have confirmed sliding roofs; shed-type structures have been constructed along the sides of at least 4 of the single-bay garages
Single-bay garage	Plesetsk ICBM Launch Test Site 4	6	Complete	No	No sliding-roof capability on any of the 6 garages
	Plesetsk ICBM Launch Test Site 7	6	Complete	No	No sliding-roof capability on any of the 6 garages
	Plesetsk ICBM Launch Test Site 5	1	Complete	No	This single-bay garage is a flat-roofed structure with no walls but is of sufficient dimensions to house a TEL/resupply vehicle

*Dimensions derived from the best photography available.

**Because of the time frame of initial construction, early 1972, it is believed that these footings were originally designed for a different building and were later used for the 11-bay garages.

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This included construction of a large T-shaped vehicle turnaround, a realigned rail spur parallel to the turnaround, and a widening of the RRTP access road. Also, footings were in place for construction of a shelter over the transfer point (Figure 9). [redacted] realignment of the rail spur and modification to the access road were complete. Wall panels had been erected and roofing of the shelter had begun. The upgrading of RRTPs, which for years have been used in the transloading of lighter liquid propellant missile systems, will provide additional photographic recognition signatures for future SS-X-20/-16 mobile missile deployment.

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New Building Construction and Modifications at Plesetsk Missile Test Center

15. Since early 1974, construction of new buildings and modifications to existing buildings/bunkers have been seen at three SS-7 launch sites and one SS-8 launch site at the test center. This activity is similar to some of the new construction/modifications underway at the deployed SSM sites at Konkovichi, Kozhanovichi, and Drovyanaya (Tables 1 and 2). Although similarities exist at the four launch sites at Plesetsk, only sites 4 and 7 have both single-bay and 11-bay garages resembling those at the deployed complexes (Figures 10 and 11). Modifications and building construction at Plesetsk launch sites 5 and 6 are discussed in more detail in a previous NPIC report.⁵

16. [redacted] footings for a garage with 11 bays were observed at Plesetsk Launch Test Site 7, an SS-8 soft site. Subsequently, construction began on footings for one 11-bay and one possible 11-bay garage at this site and for one at Plesetsk Launch Test Site 4, an SS-7 soft site. Although the buildings at Plesetsk are in an early stage of construction, the construction techniques used are similar to those of the 11-bay garages at the three deployed SSM complexes. However, one of the 11-bay foundations at launch site 7 and the one at launch site 4 appear to be 6 meters deeper. Based on the number of footings, the other confirmed 11-bay garage at site 7 appears to be the same as the 11-bay garage at the deployed complexes. The 6-meter difference in depth is the result of an additional footing being added to the foundation. The 11-bay building foundations at the three deployed SSM complexes consist of 12 rows of three stanchion footings and a front pilaster block (Figure 4B). At Plesetsk, this foundation consists of 12 rows of four stanchion footings and a front pilaster block (inset, Figure 10). The reasons for this increase in depth of the bays are not known. However, if the two Plesetsk Launch sites are to be used in testing/training for the mobile SS-X-16 missile system, this difference in the size of the 11-bay garage would be a significant photographic signature, permitting the identification of a support base as being constructed for either a mobile IRBM or ICBM.

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17. Between January and April 1975, six single-bay garages were constructed at both launch sites 4 and 7.⁶ These 12 garages are similar to the single-bay garages at the three deployed SSM complexes only in that they are single bay and drive in (Figure 12). The dissimilarities, however, are more numerous. The single-bay garages at Plesetsk are different from the other single-bay garages at the deployed complexes in the following ways: they are [redacted] longer; they do not have sliding-roof sections; they are probably constructed of sheet metal; the garages have two vestibules for personnel access on one side; each garage has a walk-in-type door with two windows on either side at the rear; and each garage is served by an aboveground steamline. Although these buildings appear to be launch-support related, buildings of similar design have been seen throughout the Soviet Union being used for bulk storage and for general support.

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18. Since the TEL, the resupply vehicle, and the associated GSE for the SS-X-16 and -20 are apparently the same, the structures built to house the vehicles for these two systems probably will be similar. This is suggested by the similarity of some of the construction at the three deployed SSM complexes and at the two test centers.

19. To date, there is no photographic evidence, however, to suggest that the buildings at launch sites 4, 5, 6, and 7 at Plesetsk will be used to support any system other than the SS-X-16.

Mobile Troposcatter Communications

20. The TWIN EAR mobile communications system is apparently an integral part of the SS-X-16 and SS-X-20 mobile missile systems. This belief is based on the continued observation of TWIN EAR at facilities which are associated with the research and development of these mobile missile systems. Furthermore, the trailer-mounted TWIN EAR (inset A, Figure 13) probably will be the stationary unit collocated and operated in conjunction with the existing SRF communications network. The truck-mounted TWIN EAR (inset B) will probably be deployed with the missile unit in the field.

21. At KYMSTC, a concrete apron was constructed on the south side of the Kapustin Yar Medium Range/IRBM Bivouac/Troop Training Area. Since the completion of the apron in late 1975, two trailer-mounted TWIN EAR have been parked on the apron on all subsequent photographic coverages. [redacted] a probable correspondent to the trailer-mounted TWIN

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Table 2. Summary of Modifications of Existing Major Launch Site Support Buildings/Bunkers

Type Building/Bunker	Location	Number of Buildings/Bunkers Being Modified	Type of Building/Bunker Modification	Remarks
Missile-ready bldg	Konkovichi Launch Site 1 (nuclear storage facility)	2	Changed from drive-in to drive-through capability	
Missile-ready bldg	Kozhanovichi Launch Site 2 (launch area)	2	External re-roofing of [] at each end of the building.	Modification to north entrance of building; overall length []
Missile-ready bunker (4 bay)	Drovyanaya Launch Site 4	1	4-bay bunker changed from drive in to drive through; roof vents added	Although visible change is not discernible at these two buildings, it is possible that some type of internal modification did occur.
Missile-ready bunker (2 bay)	Drovyanaya Launch Site 4	1	Extension added to rear of 2-bay bunker; also, changed from drive in to drive through	
Missile-ready bldg	Plesetsk Launch Test Site 4	2	Roof vents added to each of the 4-bay drive-through buildings	
Missile-ready bunker	Plesetsk Launch Test Site 5	2	Both 4-bay bunkers changed from drive in to drive through; roof vents added	
Missile-ready bunker	Plesetsk Launch Test Site 7	2	4-bay; converted from rail-in to drive-through bunker; roof vents added	
Missile-ready bunker	Plesetsk Launch Test Site 6	3	Converted from drive-in to drive-through, two-bay bunker; stanchions added to end of each of these bunkers; however, construction has not been completed	

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EAR was identified in a possible communications exercise approximately 43 nm northwest of the troop training area at the Kapustin Yar/Lake Elton Tracking Facility [redacted] A truck-mounted TWIN EAR was seen at the tracking facility in an operational mode with the antennas oriented on an azimuth of 210 degrees. [redacted] a trailer-mounted TWIN EAR on the paved apron at the troop training area was seen in an operational mode with antennas oriented on an [redacted]

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22. Based on the identification of both types of TWIN EAR vehicles at KYMSTC as probable correspondents, it seems that the trailer-mounted TWIN EAR seen at Konkovich MRBM Regiment Headquarters Receiver/Bunker/Hard (Figure 13) and at Drovyanaya ICBM Complex Command Post/Bunker will be the stationary units operating in conjunction with the SRF communications network. It is expected that the truck-mounted TWIN EAR will arrive along with the initial shipment of SS-X-20 GSE at these two SSM complexes.

REFERENCES

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DOCUMENTS

- 1. NPIC [redacted] PIR-019/76, *Dimensional Comparison of Soviet SS-X-16 and SS-X-20 Missile Canisters*, Dec 76 (TOP SECRET CHESS RUFF [redacted])
- 2. NPIC [redacted] RCA-15/0002/77, *Activity and Developments at Plesetsk Missile/Space Test Center SSM*, November 1974— May 1976, Nov 76 (TOP SECRET CHESS RUFF [redacted])
- 3. NPIC [redacted] PIR-025/75, *New Construction Activity at Plesetsk ICBM Launch Test Sites 4 and 7 Plesetsk Missile/Space Test Center SSM*, USSR, Jul 75 (TOP SECRET RUFF [redacted])

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*Azimuth measurement is accurate to within \pm (10 degrees) at a 95% confidence level.

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List of Conversion Factors by Classification

UNITS OF LENGTH

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
MILLIMETERS	0.0394	INCHES
CENTIMETERS	0.3937	INCHES
INCHES	25.4000	MILLIMETERS
INCHES	2.5400	CENTIMETERS
FEET	0.3048	METERS
FEET	0.0003	KILOMETERS
YARDS	0.9144	METERS
METERS	3.2808	FEET
METERS	0.0005	MILES(NAUTICAL)
METERS	1.0936	YARDS
KILOMETERS	3280.8400	FEET
KILOMETERS	0.6214	MILES(STATUTE)
KILOMETERS	0.5400	MILES(NAUTICAL)
MILES(STATUTE)	1.6093	KILOMETERS
MILES(NAUTICAL)	6076.1154	FEET
MILES(NAUTICAL)	1.8520	KILOMETERS
MILES(NAUTICAL)	1852.0000	METERS

UNITS OF MASS

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
KILOGRAMS	2.2046	POUNDS(AVOIR.)
POUNDS(AVOIR.)	0.4536	KILOGRAMS
SHORT TONS	0.9072	METRIC TONS
METRIC TONS	1.1023	SHORT TONS
METRIC TONS	0.9842	LONG TONS
LONG TONS	1.0160	METRIC TONS

UNITS OF VOLUME

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
LITERS	0.2642	GALLONS
LITERS	0.0063	BARRELS(POL)
LITERS	0.0010	CUBIC METERS
GALLONS	3.7854	LITERS
GALLONS	0.1337	CUBIC FEET
GALLONS	0.0238	BARRELS(POL)
GALLONS	0.0038	CUBIC METERS
BUSHELS	0.0352	CUBIC METERS
CUBIC FEET	7.4805	GALLONS
CUBIC FEET	0.1781	BARRELS(POL)
CUBIC FEET	0.0283	CUBIC METERS
CUBIC YARDS	0.7646	CUBIC METERS
BARRELS(POL)	158.9873	LITERS
BARRELS(POL)	42.0000	GALLONS
BARRELS(POL)	5.6146	CUBIC FEET
BARRELS(POL)	0.1590	CUBIC METERS
CUBIC METERS	1000.0000	LITERS
CUBIC METERS	264.1721	GALLONS
CUBIC METERS	35.3147	CUBIC FEET
CUBIC METERS	28.3776	BUSHELS
CUBIC METERS	6.2898	BARRELS(POL)
CUBIC METERS	1.3080	CUBIC YARDS

UNITS OF AREA

<i>IF YOU HAVE</i>	<i>MULTIPLY BY</i>	<i>TO OBTAIN</i>
SQUARE CENTIMETERS	0.1550	SQUARE INCHES
SQUARE INCHES	6.4516	SQUARE CENTIMETERS
SQUARE FEET	0.0929	SQUARE METERS
SQUARE YARDS	0.8361	SQUARE METERS
SQUARE METERS	10.7639	SQUARE FEET
SQUARE METERS	1.1960	SQUARE YARDS
SQUARE METERS	1.0000	CENTARES
SQUARE METERS	0.0002	ACRES
SQUARE METERS	0.0001	HECTARES
ACRES	4046.8564	SQUARE METERS
ACRES	0.4047	HECTARES
HECTARES	10000.0000	SQUARE METERS
HECTARES	2.4711	ACRES

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